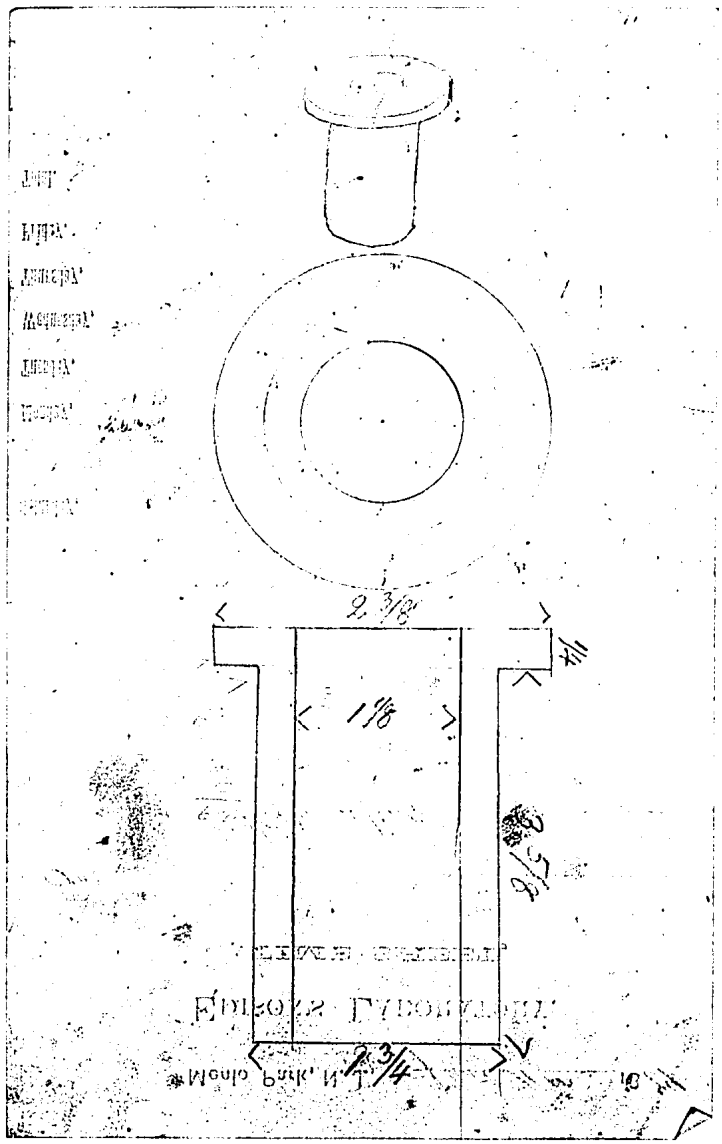
UNBOUND NOTES AND DRAWINGS

1879


2 3/8
1 1/8
2 3/4

Menlo Park, N. J., Jan 4th 1879

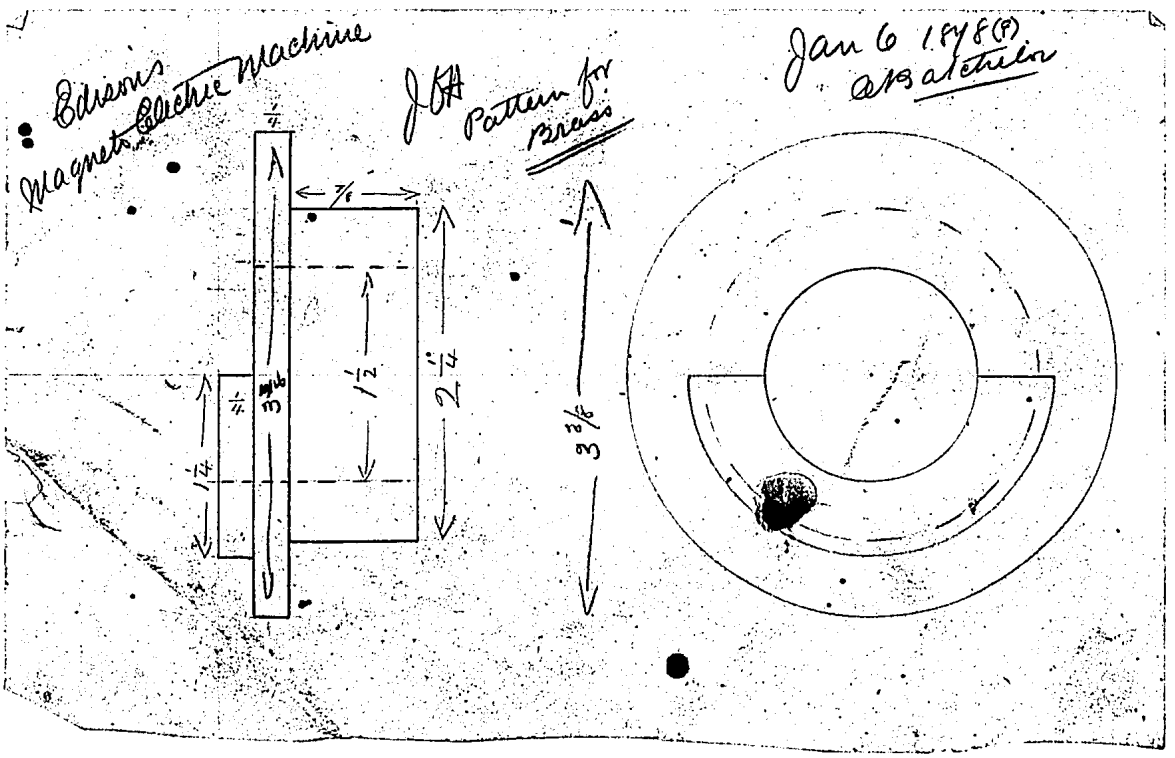
EDISON'S LABORATORY,

TIME SHEET,

For

Week ending

Saturday,											
Monday,											
Tuesday,											
Wednesday,											
Thursday,											
Friday,											
Total.											


Edison's
magneto-Electric machine
J.H.
Pattern for
Brass
Jan 6 1879 (P)
as a whole
1/4
7/8
1 1/2
2 1/4
1/4
3/16
1/4
3 5/8

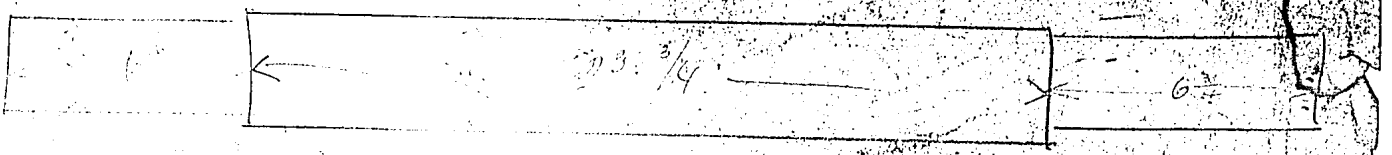
Edisons Magneto-Electric Machine

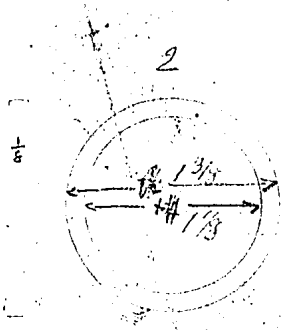
Jan 6 1879

Chronographic Telegraph

Mr Jackson

1 Shaft 1½" diam. in middle
and one end ¼ in 6¾ in long
and the other ¼ in 6 in long

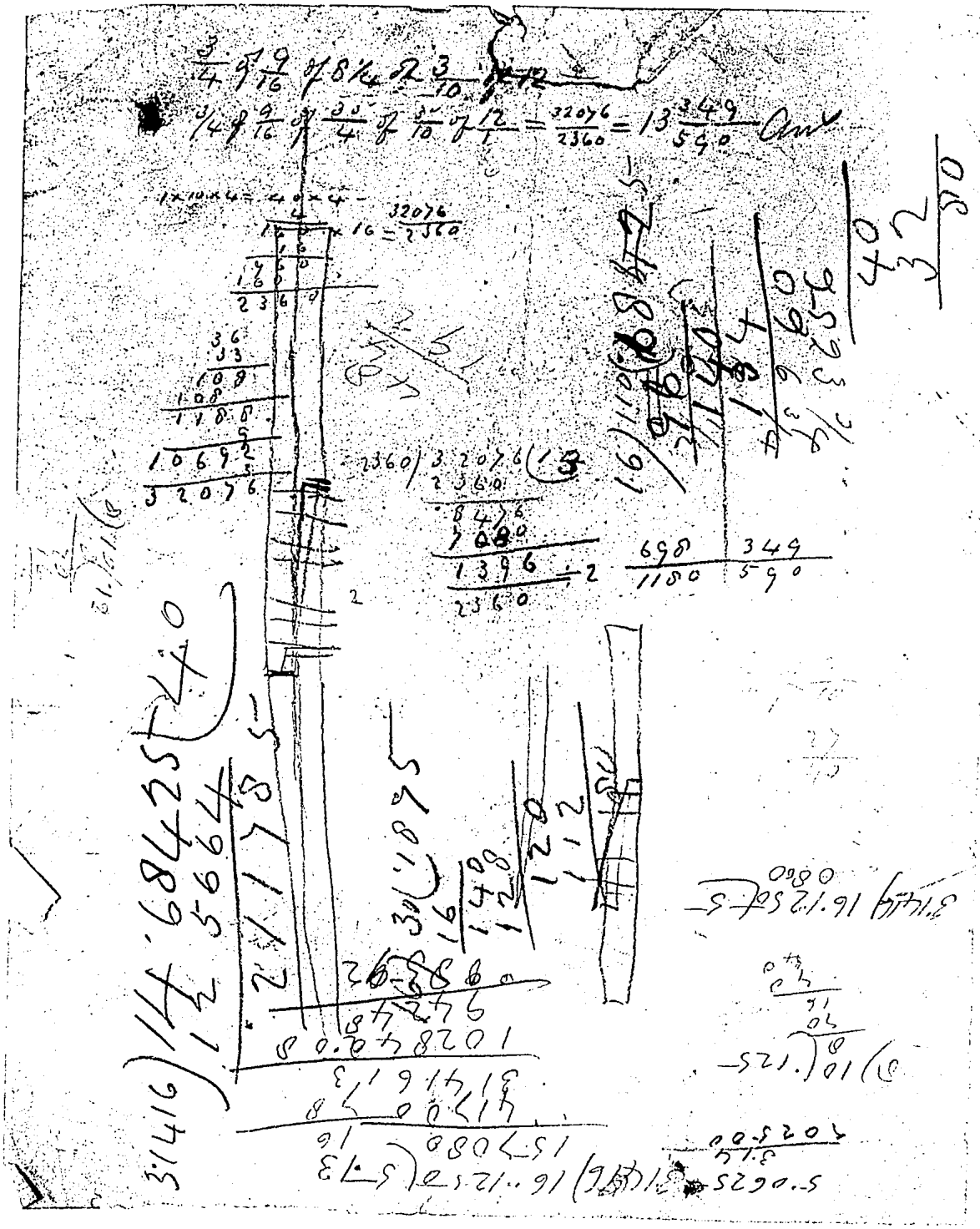




Also

2 washers ½ mm loose on
small ends

Leave the middle a shade large
so that it can be filed to the
hole after Logan has bored it



Resistance cold with 1 Callaud cell 6.39 ohms

Iridium Platinum alloy 20 pc for Nickel Plating

Spool No. 1801 No 1

Fresh - Bradley gal. Straps shunted with thick wire = Bradley Rheostat Coil 4 Jan 14 1879

Size of Wire	Length of Wire	No of Cells	Deflect^n	Colors	ohms Resistance	Deflection^2 × Resistance	Ratio to $C^2 \times R$ when cold	Ratio $C^2 \times R$ when dull Red		Remarks. Sharp Batteries
.004	150 ~~1500~~	1	4°	nil	6.39	39.				
"	"	2	6°	nil	7.8	86.	2.19			
"	"	3	8°	nil	8.1	159.	4.06			
"	"	4	10°	just beginning Kahno	8.8	273.	6.97			
"	"	5	11°	Red	9.8	369.	9.42	1.35 ~~2.04~~		
"	"	6	12.30	Bright red	10.2	499.	12.7	1.85	1.35	
		7	13½	Yellow Red Orange	11.4	639.	16.2	2.34	1.73	Looks at distance of 2 feet ½ thick
		8	14½	Yellow + almost ant. light	11.4	740.	18.9	2.71	2.	" " " " 1/16 thick
		9	15°	Quite White	12.2	875.	22.3	3.21	2.38	Appear a shade over 1/16 thick
		10	16°	Bright light	12.6	1030.	26.5	3.79	2.8	" " " " " "
		11	17½	White light ant. shade of Yellow.	12.96	1280.	32.7	4.68	3.48	Seems covered with fine lines at edges like sea shading on map.
		12	18½	full White	13.26	1470	37.8	5.4	3.98	
		13	19½	Brilliant White	13.56	1700	43.4	6.22	4.61	
		14	19½	Intense White	13.86	1720	44.	6.31	4.67	Sufficiently brilliant for our purposes.

Iridium Platinum Alloy 10 pc Spool No 2 —
Condit'n of large Cell Carbon —— = Bradley Gals. No 2 shunted with short wire No 2
Resistance cold on 1 Calland Cell 6° ohms —

Size of Wire	Length of wire in m.m.	No. of Cells	Deflec.	Color.	Resis. to others	Deflec.^{2} X Resis.	Ratio to $C^2 \times R$ when Cold	Ratio to $C^2 \times R$ when Dull Red	Remarks.
.004	150	1	4°		6.8	30.			
"	"	2	6¾°		6.7	93.	3.1		
"	"	3	9½		7.3	204	8.6		Faintest glimmer of Red
"	"	4	11°	faintest glimmer of Red	7.9	297	9.7		Jan. 14 1899
"	"	5	13°	Dull Red	8.5	452.	15.1	1.53	Clear Red
"	"	6	14°	Orange Red	8.73	541	18.1	1.82 1.19	
"	"	7	15°	Orange Yellow	9.2	660.	22.2	2.23 1.64	
"	"	8	16°	Yellow	9.6	788.	26.3	2.64 1.74	
"	"	9	17½	Whitish Yellow	10.	991.	33.1	3.31 2.21	
"	"	10	17½	Yellowish White	10.3	1020	34.1	3.43 2.26	
"	"	11	19	White	10.5	1240	41.4	4.17 2.74	about same as candle
"	"	12	19½	full White	10.7	1340	44.5	4.53 2.97	can just see the fringes
"	"	13	20½	Bright White	11°	1530	51.2	5.16 3.39	fringes very prominent
"	"	14	21	Brilliant White	11.5	1690	56.5	5.69 3.75	

Length of wire reduced to 140 m.m. at. globulated — Permanent elongation of Wire 1 m.m.

No 3

Jan 14 1899

Chas Batchelor

Platinum wire.

Spool No 3

When Cold on Callaud Cell 3.6 ohms

Battery Carbon C+H large ...

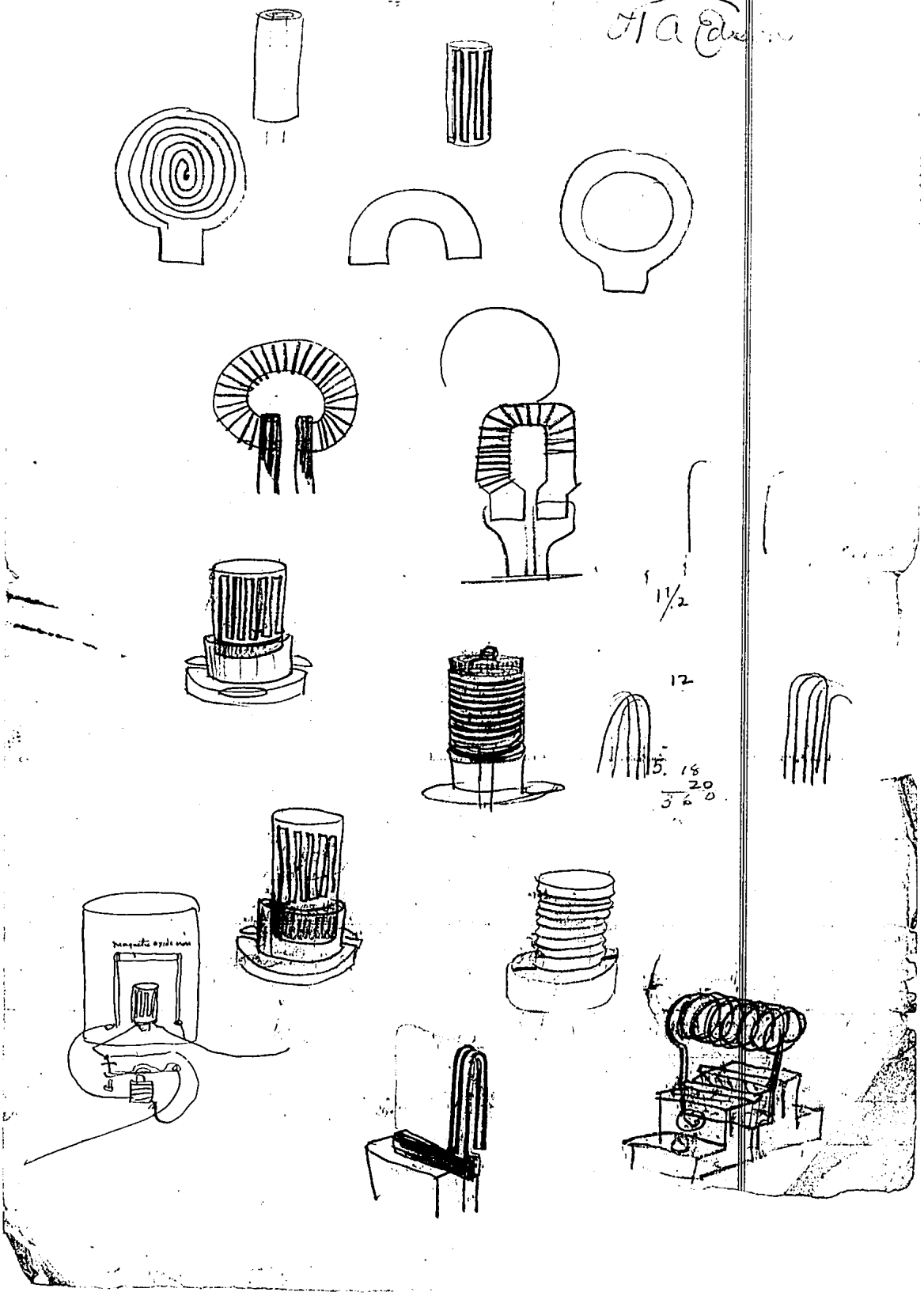
Galv. Bradley No 4 shunted with large wire.

Size	length of wire	Cells	Deflec°	Color	Resistance Ohms	Deflec² x R	Ratio k C² x R cold	Ratio k C² x R Dull Red		Remarks
.004	150 m m	1	5°		4 [illegible]	30.6				
"	"	2	8½		4.9	120.	3.56			
"	"	3	11		5.7	215	7.03			
"	"	4	13	Dull Red	6.3	346	11.3			Better than first color on No 1 & 2 Sheets
"	"	5	14	Red	7.2	447	14.6	1.29		
"	"	6	15½	Yellowish Orange	7.9	607	19.8	1.65	1.35	Special Remark — Platinum Wire .004 300 m m wound in Spiral ¼ diam 2 Cells bring it = dull red Resist. cold 6.1 ohms
"	"	7	16½	Yellow	8.3	638	20.8	1.84	1.42	
"	"	8	17½	Light bright Yellow	8.74	869	28.3	2.51	1.94	
"	"	9	18½	Whitish Yellow	9.	1.150	33.1	2.92	2.26	
"	"	10	19½	Yellowish White	9.2	1.150	37.7	3.33	2.58	
"	"	11	20½	White	9.5	1.328	43.4	3.83	2.97	
"	"	12	21	Bright White	9.9	1.452	47.6	4.22	3.26	This
		13	21½	Brilliant White	10.5	1.663	54.4	4.81	3.72	
		14		very Brilliant white						Melted before we could test

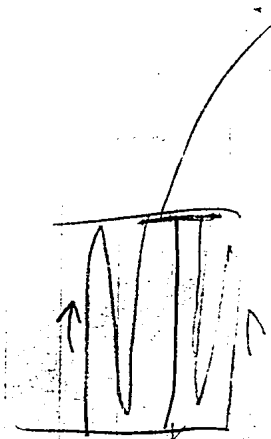
With 14 cells on 170 m.m. it melts: on 180 m.m. Deflec 21 Resist. 12 ohms

Scarcely any permanent elongation

January 28 1879

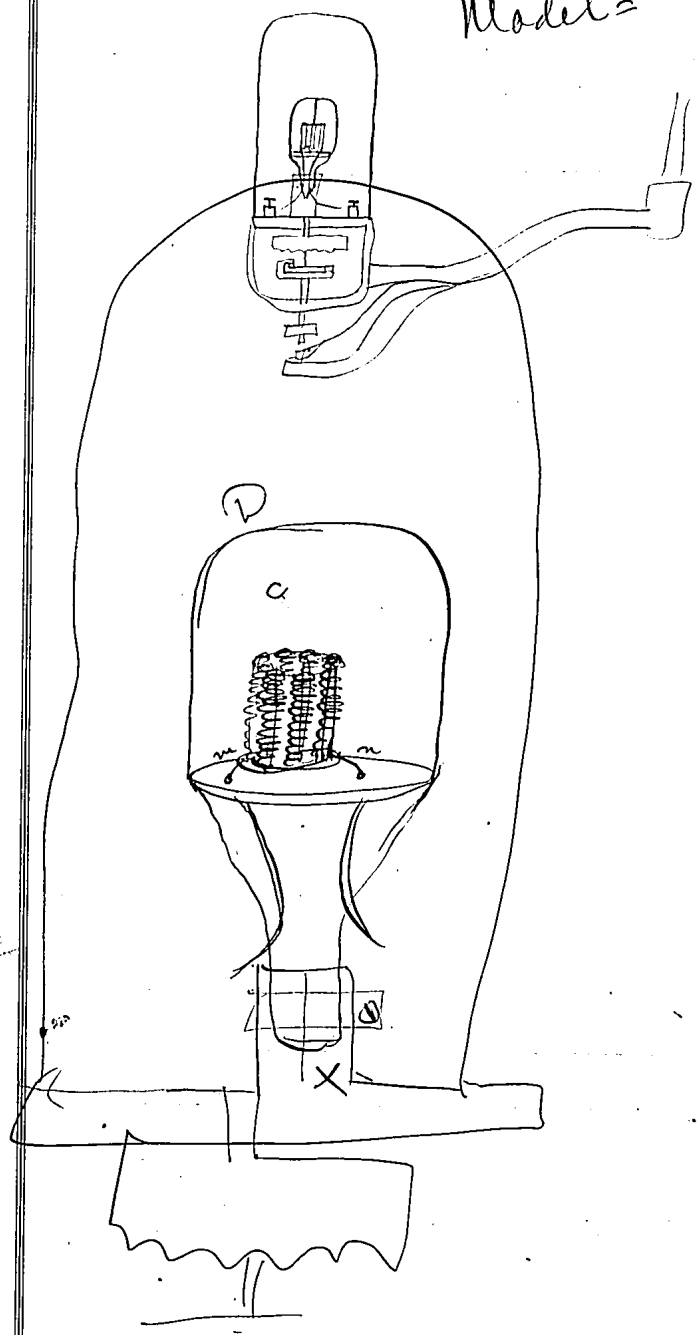


Jan 28 1879



Johnson

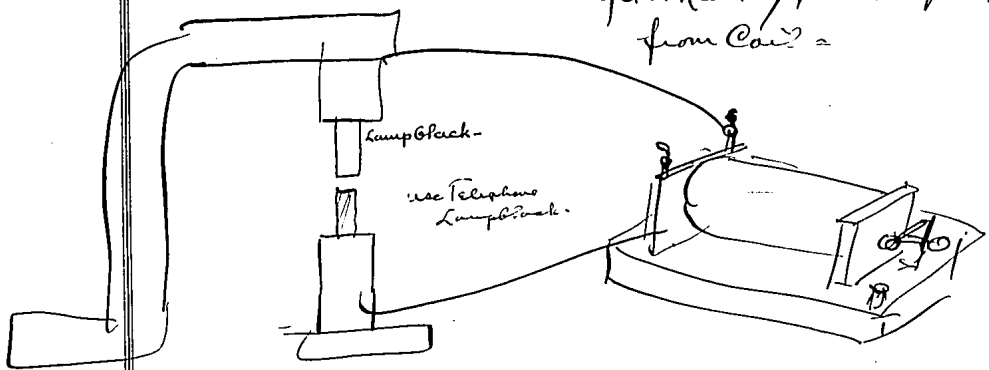
Model=



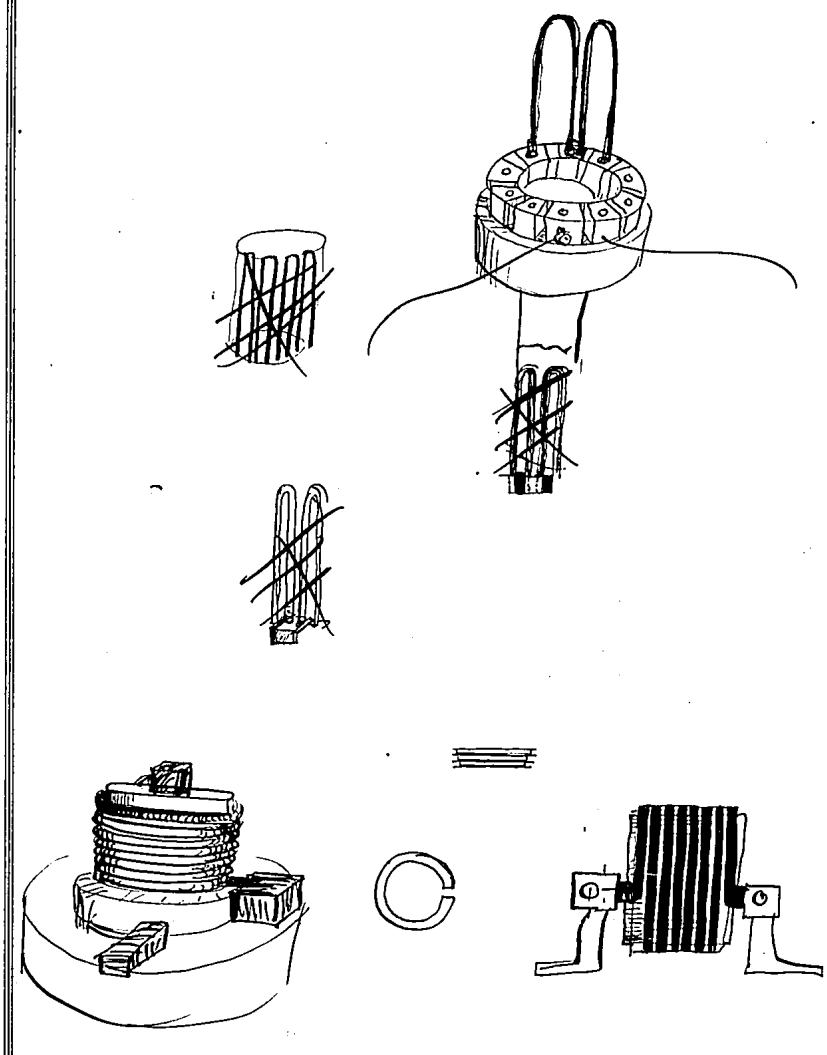
LW

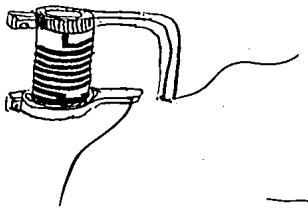
Experiments for Upton

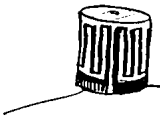
get at least 1/4 inch spark from Coil =



18
16
108
18
2(20)
2 : 20
420







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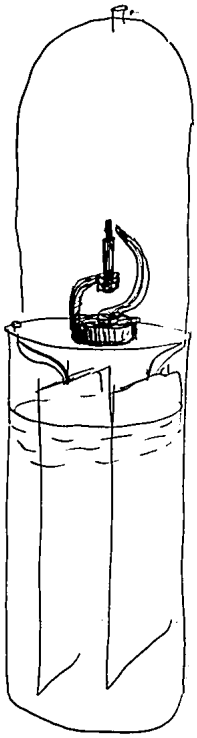
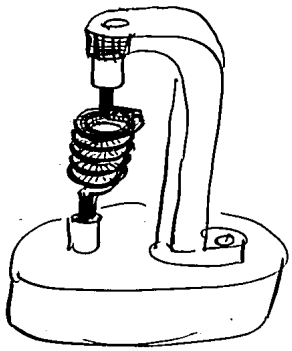




Cover &c

The object of this invention is to economically produce & subdivide the Electric light =

The invention consists in the use of an ~~oxidizable~~ incandescent conductor of very pure iron, nickel or cobalt in a vacuum

The invention further consists in the use of an incandescent conductor of platinum - Iridium Rhodium Osmium Palladium or alloys of either in a Vacuum within a second Vacuum or ~~closed~~ seal Globe at the atmospheric pressure, the heat of the first Vacuum tube due to the heating of the conductor Communicating with the air of the second Globe to Expand it for the purpose of giving motion to a current regulator as already shown in my patent ~~of~~ applied for ——————

——————— 1879 =

The invention further consists in the method of manipulating the incandescent Conductor before final sealing within the first Vacuum tube =

V.

I have discovered ~~by observing the anomalous behaviour of platinum at high temperatures~~ that chemically pure iron when drawn in wire and formed into a spiral, & then placed in a vacuum may be brought to ~~a bright~~ incandescence, I have also discovered that many metals which have gas within their pores have a lower melting point than when free from such gas - for instance Iron wire has, by drawing several volumes of Carbon Monoxide gas within its pores, If such wire be placed in a vacuum and the full current be put upon it it rises to a ~~bright~~ incandescence ~~If the~~ current is increased it reaches a brilliant incandescence & then melts but if after the vacuum has been made the wire is brought to a faint dull red for several minutes gas is occluded, then vaccum is then made again perfect & the metal ~~made bright~~ brought to a yellow heat by the current & allowed to remain so for several minutes. & the vacuum again made perfect: then by adding more & more battery manipulating the vaccum at each

increase of temperature the iron may be brought to the most dazzling incandescent which is perhaps 1000 degrees higher than its fusing point with the gases within its pores. Thus iron may be brought to a much higher incandescent than platinum or platinum-Iridium alloy in the open air.

The same effect takes place with platinum & other metals - With platinum in the open air if the current is placed on suddenly the gas within its pores expands explosively & disrupts the platinum so that it shows myriads of cracks when the sudden expansion of the gas has caused the metal to expand beyond a point where it naturally would were there no gas.

But in a Vacuum where reabsorption of the gases are prevented & by pulling on the current gradually, or before manipulating the vacuum mentioned a Platinum Iridium spiral having but 1/4 of an inch radiating surface may be made to give a light equal to 21 candles steadily for hours whereas in the open air it requires nearly 1 inch of radiating surface to produce the same effect because the melting point

of the platina alloy & gas with it is enormously lower than as described = Once the gas has been ~~acted~~ Excluded from the metal the current may be put on or off suddenly = of course porous ~~metals~~ Conductors such as carbon would be enormously benefited by this process as the ~~pr~~ sudden Expansion of the gases when the current is put in suddenly disrupts the conductor and devices have to be employed to put it on gradually to prevent the destruction of the conductor which is unnecessary by my process = I prefer to use iron for the reason that its resistance increases at a greater ratio with heat than platinum hence I can obtain a greater resistance with a smaller radiating surface than by the use of platinum or platinum iridium =

C is the burner ~~th~~ D the ~~pear~~ vacuum glass sealed with two platinum Conducting wire N & M welded in the tube & passing to the conductor, This tube is secured to the pillar X. The heat from the tube Expands the air & this causes the aneroid diaphragm to work the circuit manipulating device Substantially as shown in my application

filed

Claim -

The Combination with a thermic regulator such as described of a sealed vacuum tube containing an incandescent Conductor.

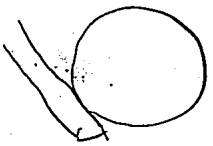
2nd The use of iron ~~nickel~~ nickel or cobalt as a material for giving light by incandescence when placed in a sealed vacuum ~~chamber~~ ~~gas~~ freed from gas substantially as described,

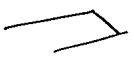
3rd The use of ~~the metals of the platinum group as a material~~ for of any conducting material for lighting by incandescence when the same is enclosed in a sealed vacuum and freed from gas as set forth =

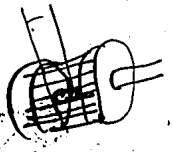
T A E

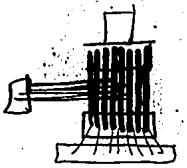
Feby 9 1879.

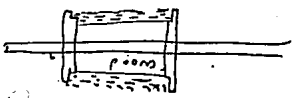
B. 22 & 24

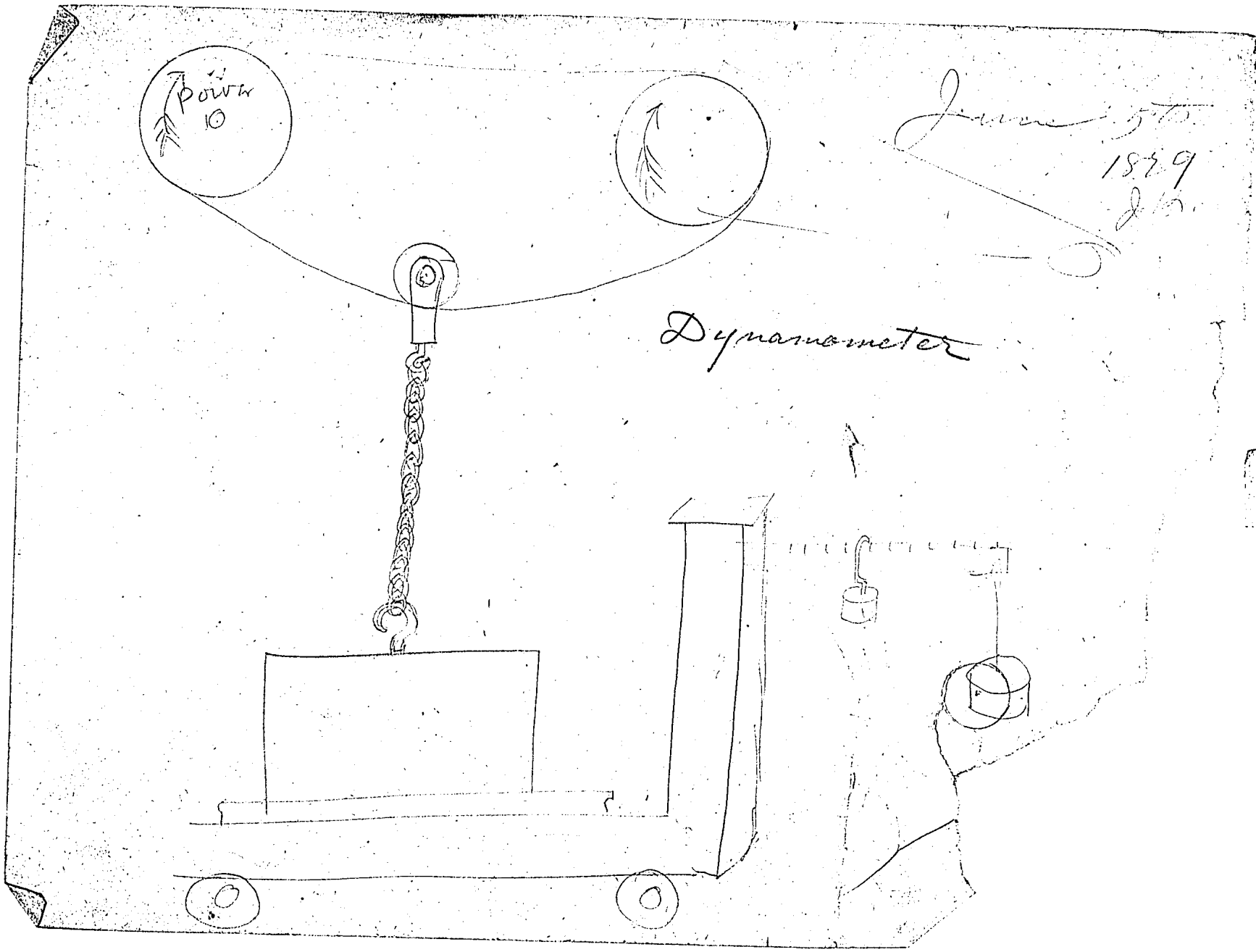


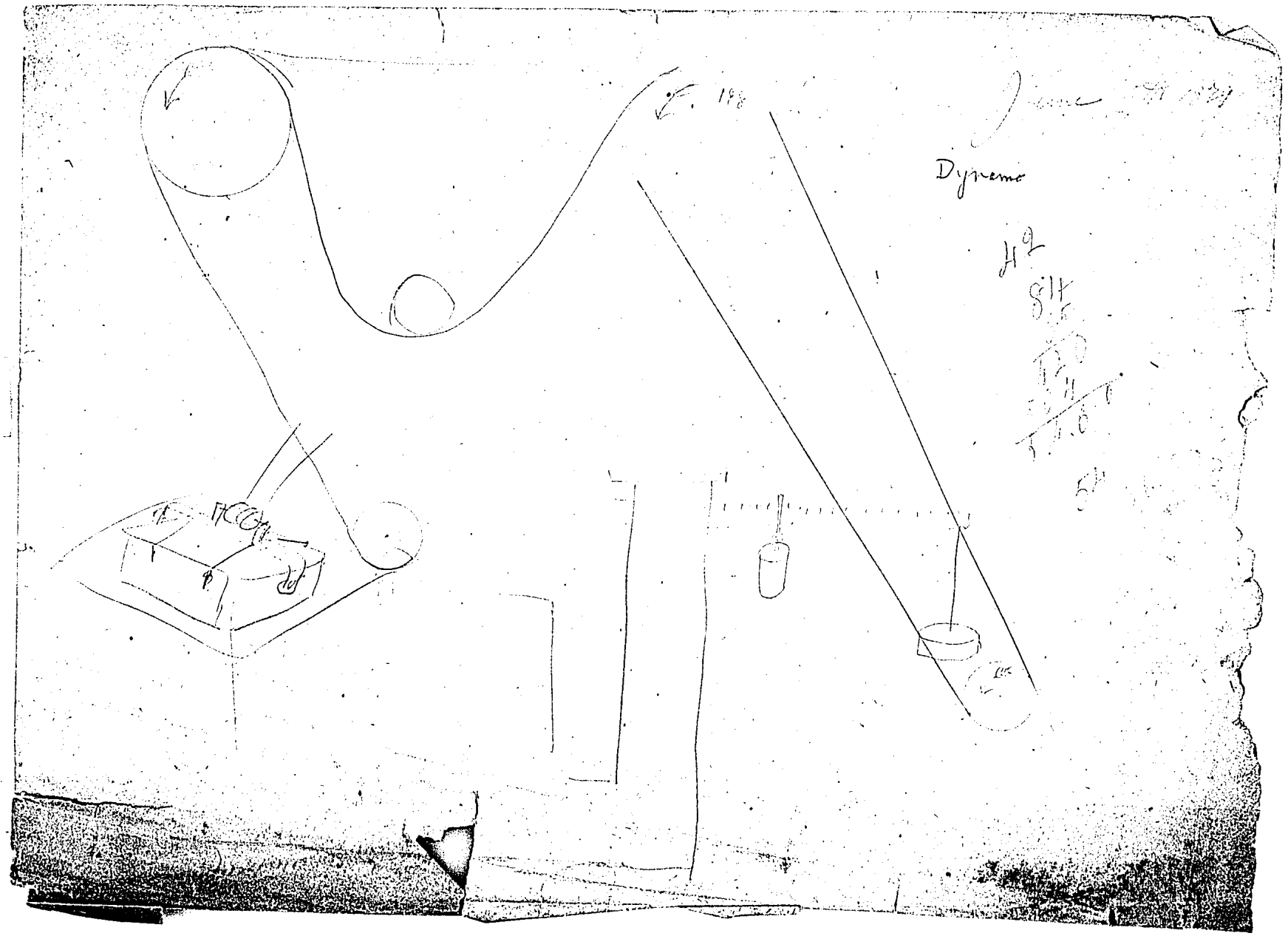









Power
10
1849
Dynamometer


Dynamo